



**Remarks of PG&E's Geisha Williams**

**WIRES 2016 Winter Meeting**

**January 21, 2016**

Good morning, everyone. It's a real pleasure to be here with all of you and on behalf of all of our employees I want to welcome you to beautiful-not so sunny-but beautiful San Francisco.

We're delighted to host all of you today in our headquarters right here off Market and Beale to support really the great work that the WIRES organization continues to do on behalf of our whole industry.

When you think about it there is so much going on, not just with our industry but really in the world around us which has an impact on our industry. I mean, I sometimes just ask myself, my gosh, how much has really changed that impacts our lives just in the last 10, 15, 20 years. Everything. Technology is having such an impact on innovation and how it impacts us both in terms of our industry but also in terms of our professional and personal lives.

Did anyone catch the recent Consumer Electronics Show that occurred earlier this month? It was unbelievable stuff. I mean, drones are becoming commonplace, all sorts of wearable technology and even robotic pets that recognize you and do a better job of obeying you than apparently the fuzzy little creatures we have at home. Clearly, better than my pet. Everything seems to be becoming smart, right? Smart phones, smart tablets, smart switches, smart technology. Smart, smart, smart. And everything is connected like never before.

We live in a world where most of us can get what we want, how and where we want it at merely the touch of a button. And for most of us, for better or worse, we are always plugged in. There is good and there is bad with that, right, and as a result our notion of values has really changed as consumers, along with our expectations around choice, convenience and control. We want virtually every facet of our lives to be just as smart and just as integrated and seamless as the web is.

And so a few years ago there was a Cisco executive that described the sort of increasingly connected world that we live in as something called the internet of things. You've all heard of that, right? And today we're seeing that internet of things really come to fruition with billions of things connected through the web in really powerful ways.

Similarly, for us in the energy landscape I have to tell you we're going through tremendous change. We have more growth and more innovation in the last 15 years than in any other point in the last century. And that change is predicated on a couple of really basic things that I want to cover.

First, and this isn't news to anyone in our industry, right, the convergence of information technology and energy in a really meaningful way.

We're also seeing work at the policy level, at the state level all around us, as well as at the federal level. At the federal level the Obama Administration's Clean Power Plan is going to be transformative to the industry. And within our own state here in California we have been dealing with a host of truly ambitious climate change policies and goals.

Then on top of that the innovation that's occurring all around us up and down the supply chain from production and advances in generation all the way through transmission and delivery to the end user consumers in their homes.

Meanwhile, while all this is happening, our customers are changing too. They're connected, they have devices and our customers are saying they want more. They want more autonomy, they want more convenience, they certainly want more choices.

But they also want the stuff they've always had, right? They still want that reliable power source to be there, and they want it to be safe and it's got to be affordable, particularly for our lower income customers that really struggle to make ends meet.

As we look at all this and we look at our customers we also realize that they want one other thing. They want to play a role in the battle against climate change. We see that in our state here in California. And that's not enough. They want us, all of us, as energy providers to help them achieve their goals to be cleaner, to have a carbon neutral footprint in their homes and businesses.

For us here in California—and we are an hour north of Silicon Valley with customers that truly embody what it means to be clean—for us as energy providers, electric providers here in the state in northern and central California this is up close and personal for us. We are dealing with it here and now, it is real.

We believe, I believe, that we are so privileged to operate and live in a state that has been frankly so progressive and forward thinking when it comes to energy and when it comes to climate change. So I want to give you some examples of what it's like and the types of things we've been doing here in California over the last several years.

Many of you know that we set ambitious renewable energy goals several years ago that started with achieving a 20% RPS level by 2020. 20 by 2020. Sometime in 2010 we went to 33% because we were making such great progress. And now last year's legislative session we passed a bill that said that by 2030 we will be at 50% RPS.

Some of you in the room that are not from California are going, "Oh, my goodness. Can we do it?" The answer is yes we can do it. Today as I stand here before you I can tell you we're at 30% RPS. And when you include our large hydro units, we have an incredible hydro operation, and you add our clean nuclear fleet, all told the electricity that we're delivering to our customers—it's nearly 60% greenhouse gas free. And I have to tell you, we are very proud of that accomplishment and we are very much looking forward to taking it to the next level. We view 50% RPS, which is the new mandate, as a floor not a ceiling. And we're going to do everything in our power to continue to help this state achieve its goals of really having as close to carbon neutral electricity as possible.

I want to talk about a few other things that the state has. We have a cap and trade program that is up and running and by all accounts extremely successful. Our customers have not just adopted rooftop solar, they have embraced rooftop solar with more than 200,000 units in our service territory alone—which by the way is the most of any other IOU, any other utility and represents about 25% of the whole population in the country. Amazing.

We were pioneers, and I think a lot of folks in this room know this, in energy efficiency. We started 40 years ago before it was cool to do it, right? So here's the result. With all this technology adoption in the homes and all this electrification in homes in the rest of the country they are actually seeing energy consumption that is increasing on a per capita basis, but when you look at our customers here at PG&E, that consumption, near Silicon Valley, is flat and we're proud of the fact that our energy efficiency has played a huge role in keeping energy usage really at bay.

We were very early adopters of smart grid technology and smart meters, and today we have deployed just about 10 million smart meters up and down our service area and we're seeing the benefits.

We also have more electric vehicles than anyone else. As a matter of fact, about 25% of all the electric vehicles again are in our service area and you heard me mention the Consumer Electronic Show just a minute ago. Well, electric vehicles were a big part of this year's show. In fact, it was the new EVs about to be introduced at a really affordable prices that was the talk of the show. Frankly, we think that's great news for the industry and it's even better news for our customers who are able to now afford getting some of these electric vehicles.

I'm going to talk about a new program we're establishing with BMW later to give you a sense about how electric vehicles and the grid work hand in hand. So all told, truly amazing things have happened and frankly will continue to happen and we are thrilled to be a part of it and thrilled to be at the center of it.

Which brings me to the role I think all of us play as owners and operators of the grid. The T&D system, which we call the crown jewel of the electric system. And I want to talk about three key aspects in terms of the roles that we play in making sure that this grid continues to be relevant into the future.

First, and I think perhaps the most important role that we play, is the work we do to invest in our grid to continue to modernize it, to continue to enable it to provide the types of services that our customers want in the future. We need to make sure we're doing our part to help our customers with the choices they want to make in the future. For example, here at PG&E we're making the grid smarter, more dynamic and better able to integrate distributed energy resources such as rooftop solar, electric vehicles and storage. We're preparing to handle additional large-scale, utility-scale renewables as we stretch to reach the 50% RPS target by 2030, including as you all would know, the need for a lot more transmission projects to be able to deliver this clean energy from sometimes in the southern part of our service area to our load centers which tend to be in the northern part. Transmission projects are an important part of making the entire system work.

We're also hardening the grid because it's important to make it more resilient in the face of climate change. I mean let's be honest, aren't we all seeing extreme weather up and down our service areas. Why is that? Some people would argue it's just coincidence, or maybe it's part of climate change. But regardless, we need to be taking actions to make our grid more resilient and harden it so that it doesn't take a serious toll on our communities when these extreme events occur, whether it was Super Storm Sandy or some of the tornados that swept through parts of the Midwest or whether it's flooding. We all need to take a step back and say what are the implications for our grid? What are the types of redundancies that are needed? Do we need additional automation? We think the answer to that is yes.

To enable all of these capabilities we're investing in technology that gives us two huge advantages. First, it gives us much better visibility into real-time operations deep into the grid that is very operational helpful. And second, this technology gives us greater flexibility. It's technology like smart meters that I mentioned already, smart switches—everything is smart—syncofusers, voltage sensors. These things are becoming foundational aspects of our system and the kinds of investments that are needed to be made today not just to provide great electric service today but to really enable the type of future that we envision tomorrow.

Smart switches, for example, have already helped us save millions, millions of minutes of interruption because of their ability to switch around problems in parts of our circuits and redirect current as needed. So today smart switches are helping us improve reliability and in the future smart switches will help us move towards a more self-healing grid.

Putting it all together, when I step back and look at all the work we're doing here at PG&E we're creating kind of an analogous internet of things. We're creating a grid of things. So what is a grid of things? A grid of things ultimately enables an interconnected plug-and-play low-carbon energy future. Just like the internet maximizes benefits of the billions of things that are interconnected to the web, we believe the grid of things will do the same thing for all the energy technologies that are emerging today and will emerge tomorrow.

That's an incredibly powerful and valuable role that we believe we will play for our customers, to the larger economy and frankly for the planet. Of course, it's important to recognize that as we're making all these investments we also have to keep affordability in mind. Our customers will pay the bill, so the affordability of what we do is frankly as important as the role we think it has on the economy and the role it plays for our customers.

So, to achieve both of these objectives, which is we want a modern grid to have the potential for the future but we want it at a cost that customers can afford, there is a lot of work that needs to be done, not just in terms of efficiencies and looking at our costs and making sure we're making good choices on technology, but there is also work that needs to be done on the policy level, which is the second big area of focus that I think we all can play a role in.

As technology transforms we have a responsibility to advocate for policies that follow suit. And I want to give you a couple of examples of what this means to me. One is regarding the pricing models for the services we provide. When you think about it all of these new technologies and services that are available to our customers such as EV charging and storage rely on the grid to be enabled. In fact, these technologies often utilize the grid more intensively

because they're constantly receiving and exporting power. Charging and discharging. And so they oftentimes are more intensive users of the grid than say a more traditional customer.

So it's something we have to keep in mind. And yet the business model that's been in place for over a hundred years and that's provided for continued investment of the grid is now fundamentally challenged by these new players and these new entrants. Obviously, this is an issue that the entire industry is focused on.

Other examples of policy that's important for us to be engaged in include creating common standards for the interoperability of smart technologies and devices so that we can mix and match and use the best technologies to meet our customers' needs and provide more functionality, and frankly more choices for us, as the folks that make the decisions.

Streamlining and aligning our multiple permitting processes to shorten timeframes and move projects along, especially for transmission, is another area that I think requires some thought. How do we get projects in place in shorter timeframes of 10 and sometimes 12 years? The speed of change requires permanent reform. And we also believe that tax policies need to align with energy and infrastructure needs to continue to facilitate access to affordable capital and maintain affordable rates.

So there is lots to be done on the policy front, and what I would tell you is we need to have a point of view. We need to have a seat at the table and we need to be part of those discussions so that we can hopefully be able to affect some positive changes. At the same time, and I want to talk about the third area now.

At the same time, we know that creating a grid of the future, a grid of things, will require more than just policy work and more than just investment. It's going to require partnerships and collaboration on multiple levels, and this is an area that we've really got to focus on. So obviously, we need to work with each other as partners in the sectors, right. Looking at our service territories is one thing but looking at these on a more regional basis I think is something we all need to be comfortable with doing. That's important because it allows us to more effectively and efficiently move power, accelerate cost-effective development and deployment of low-carbon technologies and take advantage of geographical diversity of load. I think that's an area for future opportunities for us to explore.

We also need to recognize that a more digitized, automated system means that we need more robust public and private sector cooperation to protect against cyber threats and maintain the security of the system. The old system was kind of dumb and kind of impenetrable, right? The smarter you get, the more digitized you get, the more vulnerability that we have in the system. We've got to have our eyes wide open and think about how to safeguard it.

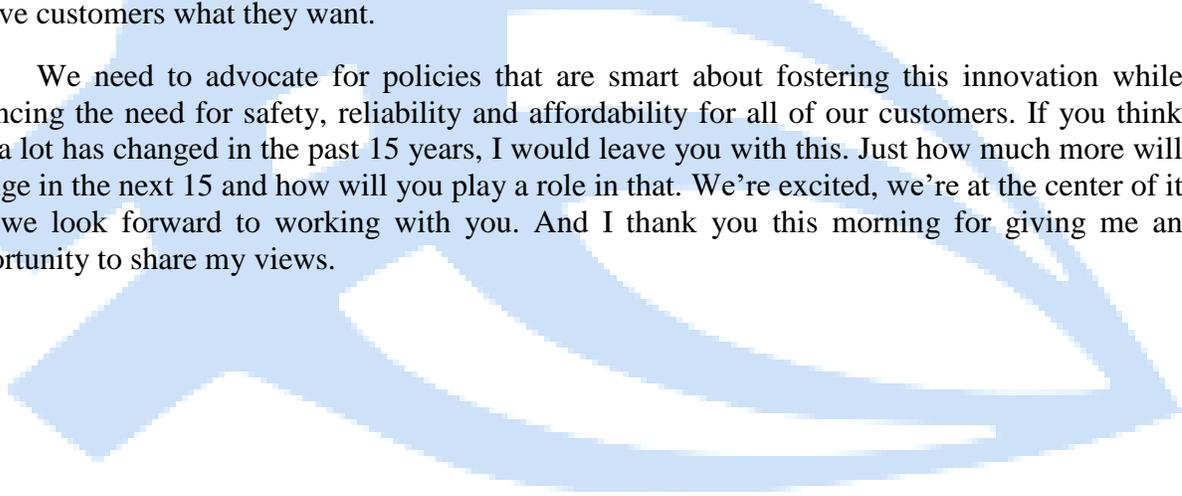
Just as importantly there is also the increasing need for us to partner with others outside our industry. We need to look at nontraditional players and innovators that are driving a lot of the change that our industry is actually seeing. And I want to give you one example of the work we're doing in that regard.

We are doing a project today with BMW. Now we've worked together on a pilot to test the ability of using EV batteries to provide services back to the grid. So here's how it works. When demand for electricity on the grid is high PG&E works with BMW to reduce energy use

for all at that particular time. BMW then sends a signal to all EV drivers that they have in this pilot and they request that they basically change their charging pattern to a later time in the day. And by the way one more thing. For any relief on top that PG&E then taps electricity from a bank of second-life EV batteries that BMW has made available to us. Pretty cool stuff. And here's the good news. Every time we've requested a reduction BMW has been able to deliver. So we're very excited about this project and about the potential we see in looking for partnerships with non-traditional providers as we look at the grid in a more comprehensive manner. It's a pilot; we're going to learn more and we'll be sharing more results in the future.

So, in closing, and I tell this to everyone who will give me the opportunity speak, I have to tell you there has never been a better time to be in the electric industry. It is exciting in a time of innovation and a time of change. We are really excited about our future. We look forward to working collaboratively with you, with your companies, to continue to shape this future. We want to learn from you and we want to share with you what we've learned. This is the time when we need to enable the next wave of innovation and energy on behalf of our customers, and we've always got to look at putting the customer at the center of everything we do and figure out how to give customers what they want.

We need to advocate for policies that are smart about fostering this innovation while balancing the need for safety, reliability and affordability for all of our customers. If you think that a lot has changed in the past 15 years, I would leave you with this. Just how much more will change in the next 15 and how will you play a role in that. We're excited, we're at the center of it and we look forward to working with you. And I thank you this morning for giving me an opportunity to share my views.



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